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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Nonprovisional Patent Application of**

**Bret M. Lincoln**

**for**

**STRADDLE STRETCHING APPARATUS**

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STRADDLE STRETCHING APPARATUS

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

5           This invention generally relates to an exercise machine, and in particular to a leg stretching exercise apparatus having a padded seat with a rear cutout, padded leg support wings, a rotating handle for adjustment of the leg support wings, and provides a natural workout position for the user.

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DESCRIPTION OF RELATED ART

          Stretch machines are used by athletes and non-athletes. Athletes typically participate in strenuous exercises and stretching relaxes muscles, prevents cramps and allows a person to loosen up prior to participating in a strenuous activity. Non-athletes include people who need to stretch for rehabilitation purposes or senior citizens who need to stretch due to circulation problems.

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20           Many stretch machines in the prior art require the user to sit down on the floor and workout in an unnatural position. This often presents a problem for people that need to stretch for rehabilitation purposes or for senior citizens who need to stretch for circulation problems.

The sit-down machine often limits the muscles that need to be stretched.

In the prior art, various approaches have been taken to provide a stretch machine. In U.S. Patent No.

5 4,647,040, issued March 3, 1987 to Ted R. Ehrenfried and assigned to Treco Products, Inc., a leg stretching apparatus is disclosed whereby an operator sits on a torso restraining means such as a seat assembly and a base assembly. The operator's legs are placed in the leg  
10 supporting means which are spread apart through the action of a crank and a pivoting of a crank assembly housing which includes a worm gear. However, this machine requires the user to sit down and it does not allow the user to stretch in a natural position.

15 In U.S. Patent No. 5,507,711, issued April 16, 1996 to Michael Richardson, a leg stretcher exercise machine is disclosed for sitting in an upright position having a centrally located padded seat and padded wings or leg platforms which are hingedly mounted on opposite sides of  
20 the seat with removable hinge pins for quick connect and disconnect from the seat. A hydraulic jack is mounted on the frame below the seat. A pump arm attached to the jack allows the user to raise the leg platforms, and a

release valve control arm is provided for lowering the leg platforms. However, this exercise machine does not allow the stretcher to stretch in what is referred to as the hurdler's stretch.

5 In U.S. Patent No. 4,844,453, issued July 4, 1989 to Gary P. Hestilow, and assigned to Century Martial Art Supply, Inc., a stretching machine for stretching the legs of an individual is disclosed comprising a seat with an adjustable back and a pair of leg bars. The leg bars  
10 have a pivot end and an opposite a termination end. Each of the leg bars is connected to a hydraulic jack having a jack handle for moving the leg bars to stretch positions. A release rod deactivates the hydraulic jack to move the leg bars back to the rest position. Leg decks attach to  
15 the leg bars, and leg pads and thigh pads are provided. However, this stretching machine does not allow the user to stretch in what is referred to as the Chinese split or the hurdler's stretch.

20 In U.S. Patent No. 5,520,598, issued May 28, 1996 to Oscar L. Little, a leg exercising machine having handlebars attached to a vertical support by means of a pin is disclosed. Mounted on the frame is a lower leg exercise device having a planar base member attached to

the base frame, distal end plates, weight posts, two  
track assemblies with a wheeled platform extending  
horizontally from the base frame. A person standing with  
a foot on each platform slides the platforms back and  
5 forth along the track assemblies by alternately flexing  
and relaxing arms and outer muscles in the person's upper  
legs. A handle bar assembly is adjustably attached to  
the vertical support. This exercise machine requires the  
user to sit down, and it does not have any support for  
10 the user's body weight allowing a safe, comfortable  
stretch.

In U.S. Patent No. 5,800,323, issued September 1,  
1998 to Cliff Ansel, an adjustable hip and thigh exercise  
apparatus 20 with padded handlebars is disclosed. The  
15 apparatus is attached to a wall and aligned with the  
pivot point of a user's hip. However, this exerciser has  
no seat.

Therefore, it is desirable to have a leg stretching  
exercise machine of minimum cost and high durability that  
20 allows the user to sit comfortably in an upright position  
and easily adjust leg supports to a stretching position.

SUMMARY OF THE INVENTION

Accordingly, it is therefore an object of this invention to provide a leg stretching exercise apparatus that helps a user stretch muscles of the upper back and lower back.

It is another object of this invention to provide leg stretching apparatus whereby the user sits comfortable on the apparatus in an upright position simulating the natural posture of a person standing.

It is another object of this invention to provide a handle whereby the user can easily turn the handle to raise the leg supports.

It is a further object of this invention to provide elastic bands on the leg supports to assist the user in performing stretch exercises.

It is another object of this invention to enable a user to perform basic stretch exercises to the most advanced exercises without using static and non-static movements.

These and other objects are accomplished by a leg stretching apparatus comprising a frame, the frame supporting a seat attached to the frame, a pair of leg supporting wings hingedly mounted on opposite sides of

the seat, and means enclosed within the frame for raising and lowering the leg supporting wings in response to a turning of a lever of the raising and lowering means.

The frame comprises a step for assisting a user climbing onto the apparatus. Each of the leg supporting wings comprises a wing support frame attached to a leg section.

The frame comprises a hinge support bar positioned adjacent to the seat for receiving the pair of hingedly mounted leg supporting wings. The raising and lowering means comprises a universal joint attached to an upper end of a threaded rod. The lever attaches to an upper end of the universal joint for rotating the threaded rod.

The frame comprises a wing drive housing having the universal joint attached to an upper end of the threaded rod enclosed therein. The threaded rod comprises a drive bar having a hex nut located in the center of the drive bar which screws on the threaded rod, and the drive bar further comprises a pair of drive extensions, each of the drive extensions being welded to opposite sides of the hex nut and extending through an opening in opposite sides of the wing drive housing. The frame comprises a crank housing, extending upwardly from the wing drive housing, for enclosing a crank rod attached to the lever.

The apparatus comprises a first strut having a first end attached to a first end of the drive bar and a second end attached to a first one of the pair of leg supporting wings, and a second strut having a first end attached to a second end of the drive bar and a second end attached to a second one of the pair of leg supporting wings.

These and other objects are accomplished by a leg stretching apparatus comprising a frame, a seat attached to said frame, a pair of leg supporting wings hingedly mounted on opposite sides of said seat, a hinge support bar positioned adjacent to said seat for receiving said pair of hingedly mounted leg supporting wings, a threaded rod positioned within said frame having a universal joint attached to an upper end, a crank rod extended between said universal joint and a lever for turning said threaded rod, a pair of drive bars attached to opposite sides of a hex nut, said hex nut moving along said threaded rod as said threaded rod turns in response to a rotation of said lever to raise and lower said leg supporting wings, a first strut having a first end attached to a first end of said drive bar and a second end attached to a first one of said pair of leg supporting wings, and a second strut having a first end



attached to a second end of said drive bar and a second end attached to a second one of said pair of leg support wings. The frame comprises a step for assisting a user climbing onto said apparatus. Each of said leg supporting wings comprises a wing support frame attached to a leg section. The leg section is slightly concave to retain a user's leg. Each of said leg support wings comprises a stretch strap to assist the user in a stretching exercise.

The objects are further accomplished by a method of providing a leg stretching apparatus comprising the steps of providing a frame, said frame supporting a seat attached to said frame, mounting on opposite sides of said seat a pivoting end of a pair of leg supporting wings, and enclosing within said frame means for raising and lowering said leg supporting wings in response to a turning of a lever attached to said raising and lowering means. The method includes the step of mounting said pair of leg supporting wings includes the step of attaching a leg support frame to a leg section. The method includes the step of providing a frame includes the step of providing a support bar positioned adjacent to said seat for receiving said pivoting end of said pair

of leg supporting wings. The method includes the said step of enclosing within said frame means for raising and lowering said leg supporting wings includes the step of attaching a universal joint to an upper end of a threaded rod.

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BRIEF DESCRIPTION OF THE DRAWINGS

The appended claims particularly point out and distinctly claim the subject matter of this invention. The various objects, advantages and novel features of this invention will be more fully apparent from a reading of the following detailed description in conjunction with the accompanying drawings in which like reference numerals refer to like parts, and in which:

FIG. 1 is a front perspective view of a straddle stretching apparatus in a down or lowered position according to the present invention;

FIG. 2 is a front perspective view of the straddle stretching apparatus in a raised position;

FIG. 3 is a rear perspective view of the straddle stretching apparatus in a partially raised position;

FIG. 4 is a perspective view of the raising and lowering mechanism including a crank and lever attached to a universal joint on the top of a threaded rod with a drive bar positioned thereon for raising or lowering the leg supporting wings; and

FIG. 5 is a top view of the threaded rod and drive bar attached to the threaded rod.

DESCRIPTION OF ILLUSTRATIVE EMBODIMENT

Referring to FIG. 1 and FIG. 2, FIG. 1 is a front perspective view of a straddle stretching apparatus 10 shown in a down or lowered position according to the invention, and FIG. 2 is a front perspective view of the straddle stretching apparatus 10 in a raised position. The straddle stretching apparatus 10 comprises a padded seat 16, mounted on a cross bar 35 of a support frame 12, a step 38 attached to a lower portion of support frame 12 to assist a user climbing on the seat 16, handle bars 30 for providing user stability when getting on and off the apparatus 10 and when exercising on the straddle stretching apparatus 10. First and second leg supporting wings 26, 28 are provided on opposite sides of the seat 16 for raising and lowering the legs of a user in response to the turning of a handle 33 of a crank 32 extending from a crank housing 45. The crank housing 48 extends upward at an angle of approximately 45 degrees from a wing drive housing 46 of the support frame 12.

A hinge support bar 17 is attached to the top of the wing drive housing 46 and in front of the padded seat 16. The first leg supporting wing 26 comprises a first wing support frame 22 attached to one side of a first leg

section 23, and the second leg supporting wing 28  
comprises a second wing support frame 24 attached to one  
side of a second leg section 25. The first leg section  
23 and the second leg section 25 have concave upper  
5 padded surfaces for a user's legs to comfortably rest  
thereon. An upper end of the first wing support frame 22  
attaches to a first end of the hinge support bar 17 by  
means of a rod 37 inserted therein and held in place by a  
cotter pin 39. Likewise, an upper end of the second wing  
10 support frame 24 attaches to a second end of the hinge  
support bar 17 by means of a rod 36 inserted therein and  
held in place by another cotter pin 39. The placement of  
each of the rods 36, 37 secured by cotter pins 39  
provides rotation points when raising and lowering the  
15 first leg supporting wing 26 and the second leg  
supporting wing 28.

Referring to FIG. 3, a rear perspective view of the  
straddle stretching apparatus 10 is shown with the first  
and second leg supporting wings 26, 28 in a partially  
20 raised position. The seat 16 having a padded upper  
surface comprises a cut-out in the rear side for ease of  
lifting the straddle stretching apparatus 10. The seat  
16 mounts on a stud (not shown) protruding from the upper

surface of crossbar 35. FIG. 3 shows the step 38 for a user to easily climb on the apparatus 10. The handlebars 30 are conveniently located extending from each side of the crank housing 48 for grasping by a user to maintain balance on the stretching apparatus 10. The seat 16 remains stationary while the first and second leg supporting wings 26, 28 are raised or lowered.

Referring to FIG. 1, FIG. 2 and FIG. 4, FIG. 4 is a perspective view of the raising and lowering mechanism 50 of the invention including a crank 32 and crank rod 51. The crank rod 51 is attached to a universal joint 56 mounted on top of an elongated Acme threaded rod 60 which is one inch in diameter with a six pitch. A drive bar 34 is positioned on the threaded rod 60. The crank rod 51 is located within the crank housing 48 and the Acme threaded rod 60 is located within the wing drive housing 46. The crank rod 51 is attached to the top portion 52 of the universal joint 46 by a weld joint. Also, the universal joint 56 attaches to the top of the Acme threaded rod 60 by a weld joint. The upper end of the Acme threaded rod 60 extends through a drive plate 58, and the drive plate 58 attaches to the wing drive housing 46 for providing a secure connection for the top of the

Acme threaded rod 60 within the wing drive housing 46.

The lower end of the Acme threaded rod 60 is positioned in a thrust bearing 62 to facilitate rotation of the Acme threaded rod 60. The Acme threaded rod 60 may be

5 obtained from Acme Threaded Products, Inc. of Westbury, New York. The thrust bearing 62 may be embodied by Part No. SFR827, manufactured by Dynaroll of San Fernando, California. The crank 32 and crank rod 51 may be embodied by standard steel stock. The universal joint 56  
10 may be embodied by Part No. CJ 6440, manufactured by Curtis, of Springfield, Massachusetts.

Still referring to FIG. 1, FIG. 2 and FIG. 4, the crank 32 is rotated when it is desired to raise the first and second leg supporting wings 26, 28. Rotating the  
15 crank 32 causes the Acme threaded rod 60 to turn, and as it turns, a hex nut 64 moves up or down on the Acme threaded rod 60. A drive bar 34, which comprises the hex nut 64 in it's center section, has a lower end of a first strut 18 connected to one end of the drive bar 34  
20 and a lower end of a second strut 20 connected to a second end of the drive bar 34. These connections are made by common bolts and nuts. The rectangular sections 34a, 34b (FIG. 5) of the drive bar 34 are welded to

opposite sides of the hex nut 64 and are made of steel.  
 The upper end of the first strut 18 connects to the upper  
 portion of the first wing support frame 22 and the upper  
 end of the second strut 20 connects to the upper portion  
 of the second wing support frame 24. The connections are  
 made by common bolts and nuts. Therefore, when the first  
 and second leg supporting wings 26, 28 are in the down  
 position as shown in FIG. 1 and the crank 32 is rotated,  
 the drive bar 34 moves upward along the threaded rod 60  
 causing the first and second struts 18, 20 to raise the  
 first and second leg supporting wings 26, 28 toward a  
 horizontal position as shown in FIG. 2. Stretch bands  
 52, 54 are provided on the sides of the first wing  
 support frame 22 and the second wing support frame 24 to  
 assist the user in stretching exercises.

Referring to FIG. 4 and FIG. 5, FIG. 5 is a top view  
 of the Acme threaded rod 60 and the drive bar 34 attached  
 to the Acme threaded rod 60 by hex nut 64. The hex nut  
 64 is in the center of the drive bar 34, and it screws on  
 to the threads 61 of the threaded rod 60. Opposite ends  
 of the hex nut 64 are welded to drive extensions 34a, 34b  
 to form the complete drive bar 34. The hex nut 64  
 comprises a circular rim 66 on an upper surface. The



struts 18, 20 attach to the outer ends of the drive bar 34 by commonly available bolt and nut combinations. The hex nut 64 is commonly available, and it has a thread to match and move along the Acme threaded rod 60 when the rod 60 is rotated.

Referring again to FIGS. 1, 2 and 3, the stretching apparatus is assembled by first attaching the first base support 40 and the second base support 42 to the interconnecting bar 44 of the support frame 12. Next, the first leg supporting wing 26 and the second leg supporting wing 28 are attached to the hinge support bar 17 located on top of the wing drive housing 46. The attachments are made by the bolts 37, 38 and cotter pins 39. A base 70 is attached to the bottom of the support frame 12 by self tapping screws. The first and second struts 18, 20 are attached to the first and second wing support frames 22, 24 respectively by commonly available nuts and bolts.

If it is desired to stretch only one leg, either the first strut 18 or the second strut 20 can be easily disconnected from the drive bar 34.

This invention has been disclosed in terms of certain embodiments. It will be apparent that many

modifications can be made to the disclosed apparatus without departing from the invention. Therefore, it is the intent of the appended claims to cover all such variations and modifications as come within the true spirit and scope of this invention.

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